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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/564,798

06/21/2007

Ralf Zuber

Umicore 0156-US

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EXAMINER

BELL, BRUCE F

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

04/19/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/564,798	Applicant(s) ZUBER ET AL.	
	Examiner Bruce F. Bell	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-32 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 17-32 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/31/06; 8/7/06</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81(c). No new matter may be introduced in the required drawing. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d).

It appears that applicants did not submit the drawings from the PCT application when filing the US application. The examiner did use the Figures from the PCT when examining this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 17-21, 23-25, 27-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Nanaumi et al (2003/0049518).

Nanaumi et al disclose a membrane electrode assembly that is provided with a solid polymer electrolyte membrane, an anode gas diffusion electrode layer and a cathode gas diffusion electrode layer disposed so as to sandwich the solid polymer electrolyte membrane. Catalyst layers and gas diffusion layers are formed on the

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anode and cathode gas diffusion layers . The catalyst layers contacts both surfaces of the solid polymer electrolyte membrane. The main component of the catalyst layers is platinum. The gas diffusion layers are made from porous carbon cloth or porous carbon paper. The solid polymer electrolyte is made of a perfluorosulfonic acid polymer. See paragraph 0048. The planar dimensions of the catalyst layer of the anode gas diffusion electrode layer and the planar dimensions of the catalyst layer of the cathode gas diffusion electrode layer are different. See paragraph 0050. The planar dimensions of the catalyst layer of the cathode gas diffusion electrode layer are smaller than the planar dimensions of the catalyst layer of the anode gas diffusion electrode layer. A bonding layer is formed on an outer circumference of the catalyst layer and the outer periphery of the solid polymer electrolyte membrane is surrounded by the bonding layer. The bonding layer functions as a seal for covering the inner catalyst layer, so as to prevent the reactant gas from being mixed with each other and to prevent short circuiting. The bonding layer on the membrane is disposed so as to be in the same position in which the end surfaces of the catalyst layer contact the membrane on an opposite surface of the membrane. See paragraph 0051. A frame shaped sealing layer may replace the bonding layer. See paragraph 0055. Figure 7 shows the MEA having a frame shape sealing member being used to seal the member against the outside environment. The bonding or seal is shown to be a fluorine agent or silicon agent. Paragraph 0062-0063 sets forth a method for forming the assembly wherein a bonding agent (seal) and hot pressing at high temperatures are disclosed. The use of the MEA is shown to be that of a fuel cell.

Nanaumi et al anticipates the applicants instant invention as shown by way of the disclosure above. The free surface of the ion conducting membrane is shown in the Figures where the anode gas diffusion layer only covers a portion of the ion conducting membrane.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 22 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanaumi et al (20030049518) in combination with Lloyd et al (20040086775).

Nanaumi et al is as disclosed above in the 35 USC 102(b) rejection above.

Nanaumi et al does not teach the membrane thickness or the use of a carbon and a metal gas diffusion layers, one on each side of the membrane electrode assembly structure.

Lloyd et al disclose a fuel cell having a metallized gas diffusion layer 100. Lloyd discloses that the other gas diffusion layer is that of a carbon cloth. The metallized gas diffusion layer is formed by applying a porous metal layer or coating onto the gas diffusion layer. See paragraph 0053. The use of a porous metal coating on a gas diffusion layer on one side of the membrane versus a carbon gas diffusion layer on the opposite side is for the purpose of varying the hydrophobicity of various portions of the gas diffusion layer and has the effect of providing substantially optimal hydration for the

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underlying ion exchange membrane. See paragraph 0046. The gas diffusion layer made in such a manner can be used on both sides or only on one side. See paragraph 0045.

The subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the instant invention was made because even though the prior art of Nanaumi et al does not disclose the use of a carbon gas diffusion layer and a metal gas diffusion layer on opposite sides of the membrane, the prior art of Lloyd et al show that this concept is known and that it is used to vary the hydrophobicity of the MEA so as to provide optimal hydration for the membrane. With respect to the thickness of the membrane, one having ordinary skill in the art would have the means by which to optimize the membranes thickness to enable optimization of the fuel cell or electrolyzer in operation. Further the thickness would be determined by the size of the fuel cell needed, the speed at which the ions are transported across the membrane and the placement of the fuel cell in the intended use of such cell. A change in size is generally recognized as being within the level of ordinary skill in the art. See *in re Rose*, 105 USPQ 237 (CCPA 1955). Therefore, the prior art of Nanaumi et al in combination with Lloyd et al render the applicants instant invention as obvious for the reasons set forth above. For example, the prior art of Cavalca et al (2004/0214064) shows examples of the perfluorosulfonic acid or Nafion being used in a fuel cell having the thickness in the range set forth in applicants instant claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BFB
April 16, 2010

/Bruce F. Bell/
Primary Examiner, Art Unit 1795